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FAY 001

CRUISE REPORT

U.S. Geological Survey
Office of Marine Geology
Woods Hole, Mass. 02543

Georges Bank - Geological Sampling

R/V H.J.W. FAY
Cruise 1
2-22 SEP 1975

M.H. Bothner - Chief Scientist

FAY 001
BOTHNER

A geological sampling cruise aboard the R/V H.J.W. Fay was conducted on Georges Bank by the Woods Hole U.S. Geological Survey between September 2 and September 22, 1975. The main purpose of the cruise was to collect cores of sediment up to 20 feet long which would provide information on the lithology and age of the subsurface sediments. The sampling locations were selected (Fig. 1) to correlate with geophysical information obtained on a later cruise to this area by other members of this office. In addition to this primary objective, a number of special studies were carried out. These include: (1) collection of suspended matter at the surface and bottom of the water column to determine total concentration, mineralogy, trace metals, and special characteristics as determined with a scanning electron microscope; (2) collection of hydrostatically damped gravity cores to determine the vertical variability of trace metals and hydrocarbons in undisturbed near-surface sediments; (3) collection of grab samples at replicate stations to statistically determine the within station and within sample variability on Georges Bank; (4) placing reference stakes in the bottom with the vibracore apparatus or on the bottom with a railroad wheel anchor to serve as a long term monitor of sediment accumulation and/or erosion at specific localities; and (5) seismic profiling, especially in areas of the reference pipes,to determine the present day forms at the sediment surface (Fig. 2 and 3).

Although all our objectives were completed satisfactorily, this cruise was plagued with equipment failures which necessitated a return to port on two occasions and a loss of 6 days of sea time. The details of these problems are give in the attached memorandum.

Scientific personnel - FAY 1
John Ostenson, Captain
Georges Bank

Leg 1A

Michael Bothner, Chief Scientist	USGS
Robert Commeau	USGS
Doug Peeler	USGS
Dennis O'Leary	USGS
David Brandon	USGS
Patty Forrestel	USGS
Lanci Valentine	USGS
Mike Kerkmann	USGS
Frank Jennings	USGS
James Katsolis	Alpine Geophysical Co.
John Ripp	Alpine Geophysical Co.
Mike Andreotta	Alpine Geophysical Co.
John Ratkowitz	Alpine Geophysical Co.
Charles Gove	Alpine Geophysical Co.
John Eastlund	Alpine Geophysical Co.

Leg 1B

William Dillon, Chief Scientist	USGS
Doug Peeler	USGS
Patty Forrestel	USGS
Lanci Valentine	USGS
Mike Kerkmann	USGS
Robert Commeau	USGS
Felicity Oram	USGS
Lyle McGinnis	USGS
James Katsolis	Alpine Geophysical Co.
John Ripp	Alpine Geophysical Co.
Michael Andreotta	Alpine Geophysical Co.
John Ratkowitz	Alpine Geophysical Co.
Charles Gove	Alpine Geophysical Co.
John Eastlund	Alpine Geophysical Co.

Leg 1C

Michael Bothner, Chief Scientist	USGS
Patty Forrestel	USGS
Lyle McGinnis	USGS
Doug Peeler	USGS
Michael Kerkmann	USGS
Peter Gleba	USGS
Felicity Oram	USGS
Stanley Locker	USGS
James Katsolis	Alpine Geophysical Co.
John Ripp	Alpine Geophysical Co.
Michael Andreotta	Alpine Geophysical Co.
John Ratkowitz	Alpine Geophysical Co.
Charles Gove	Alpine Geophysical Co.
John Eastlund	Alpine Geophysical Co.

OPERATIONAL STATISTICS

1.	Stations Occupied	27
2.	Bottom Sediment Samples	68
	a. Vibracores	21
	b. Hydrostatically Damped Gravity Cores	35
	c. Smith-McIntyre Grab Samples	12
3.	Suspended Sediment Samples	42
	a. 2m below surface	20
	b. 2m above bottom	22
4.	Reference pipes place	5
	a. Stakes driven into sediment	2
	b. Stakes w/ railroad wheel base (with pingers)	3
5.	3.5 khz Sonar and Side Scan Sonar	83 km.
6.	Mini Sparker	300 km.

SCIENTIFIC EQUIPMENT USED

Vibracore apparatus provided by - Alpine Geophysical Co.

Hydrostatically damped gravity corer

Smith-McIntyre grab sampler

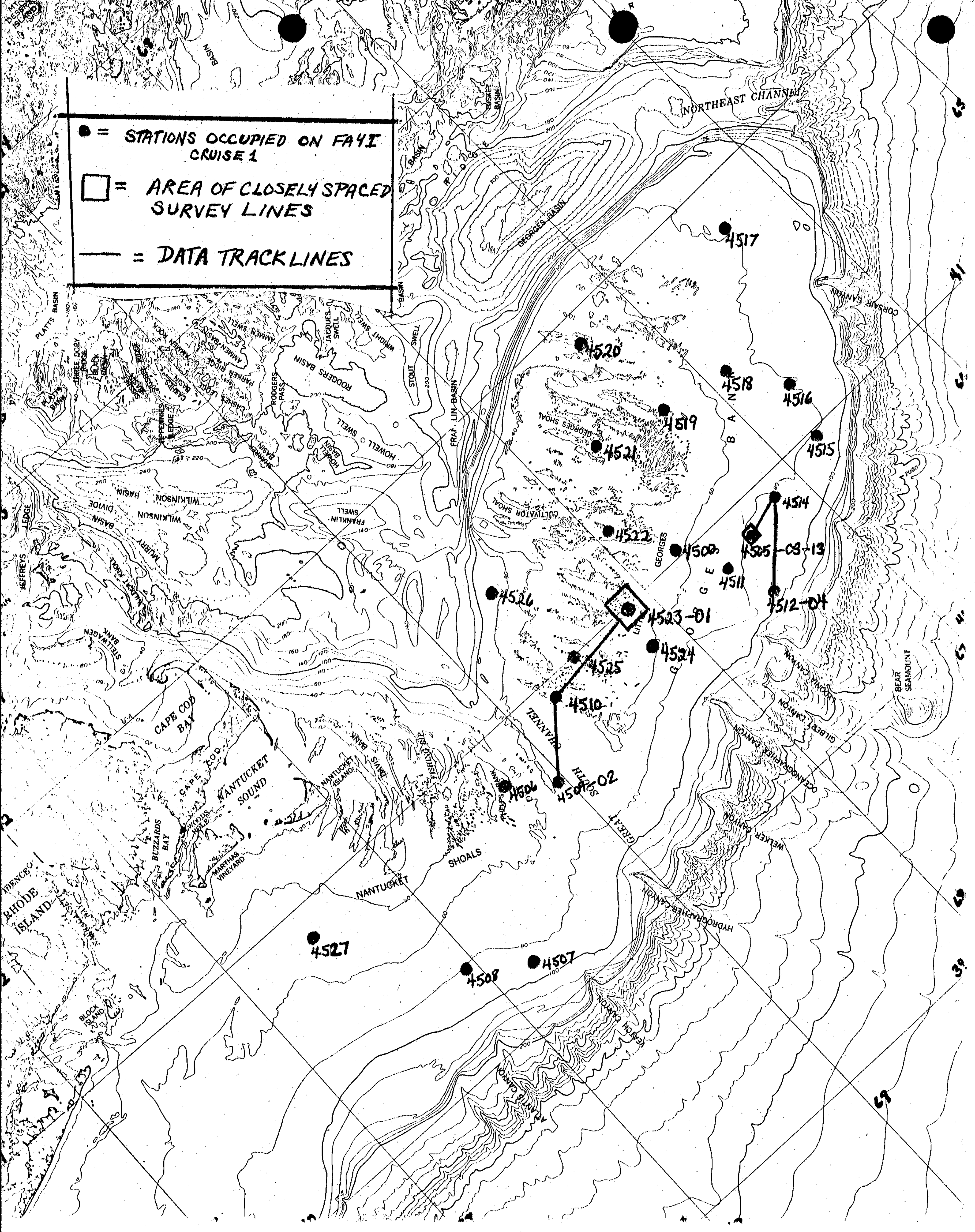
Niskin Top-Drop 30-liter water sampling bottles

Suspended-sediment filtering system

3.5 khz and side scan sonar system

Minisparker system

Navigation was obtained at all times by Loran C


● = STATIONS OCCUPIED ON FA4I CRUISE 1
□ = AREA OF CLOSELY SPACED SURVEY LINES
— = DATA TRACKLINES
NORTHEAST CHANNEL
GEORGES BASIN
CORSAIR CANYON
GEORGES SHOAL
CULTIVATOR SHOAL
GEORGES BANK
GREAT SOUTH CHANNEL
NANTUCKET SHOALS
CAPE COD BAY
CAPE COD
NANTUCKET SOUND
NANTUCKET ISLAND
MARTHAS VINEYARD
WOODS HOLE
BUZZARDS BAY
RHODE ISLAND
BLOCK ISLAND
STELLWAGEN BANK
WILKINSON BASIN
MURRAY BASIN
FRANKLIN SWELL
HOWELL SWELL
RODGERS BASIN
JEFFREYS LEDGE
PLATTS BASIN
BEAR SEAMOUNT
LYDONIA CANYON
GILBERT CANYON
OCEANOGRAPHER CANYON
WELKER CANYON
HYDROGRAPHER CANYON
VEATCH CANYON
ATLANTIS CANYON
4517
4520
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4515
4521
4514
4522
4500
4505-03-13
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4509-02
4506
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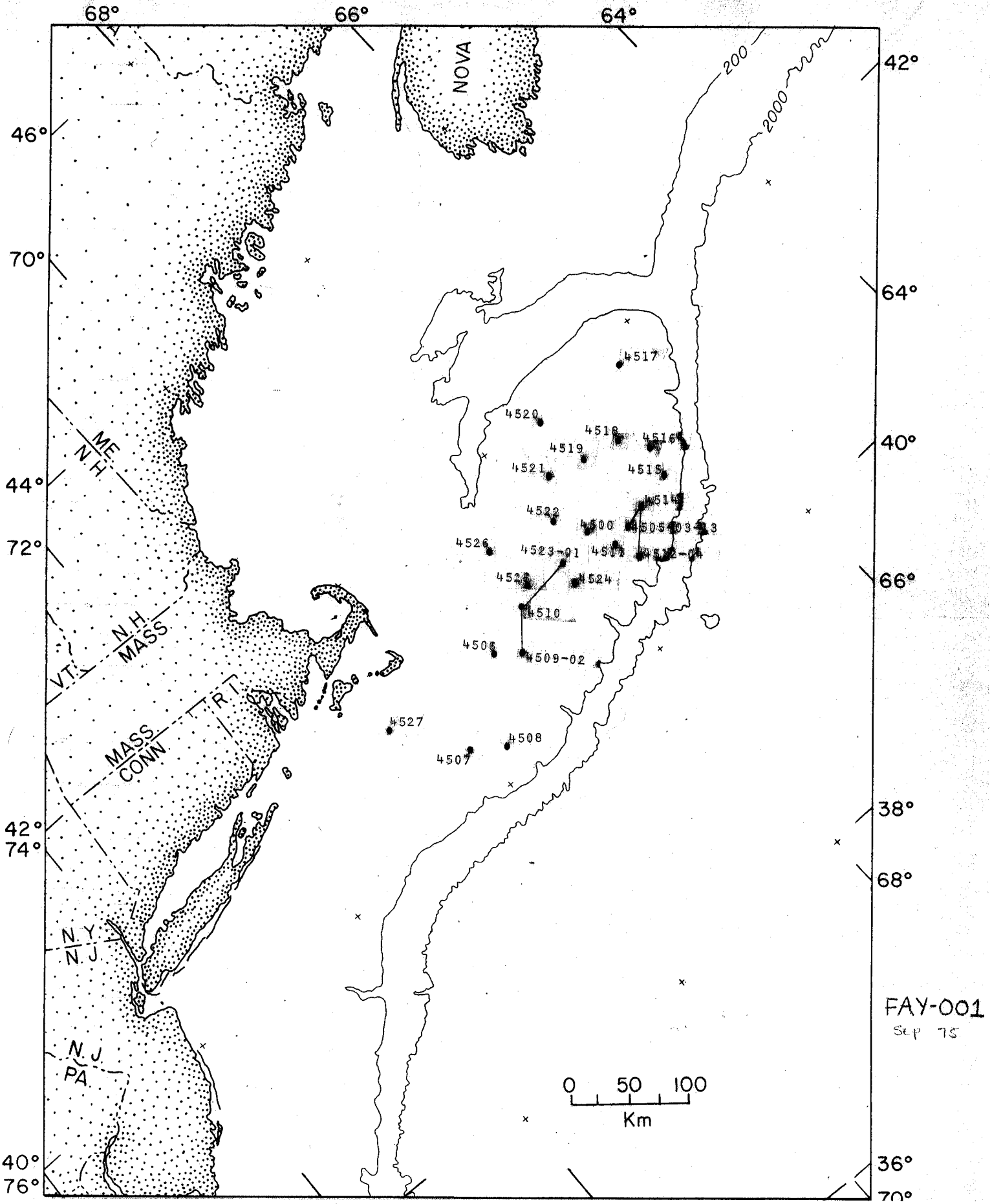
4507
4508



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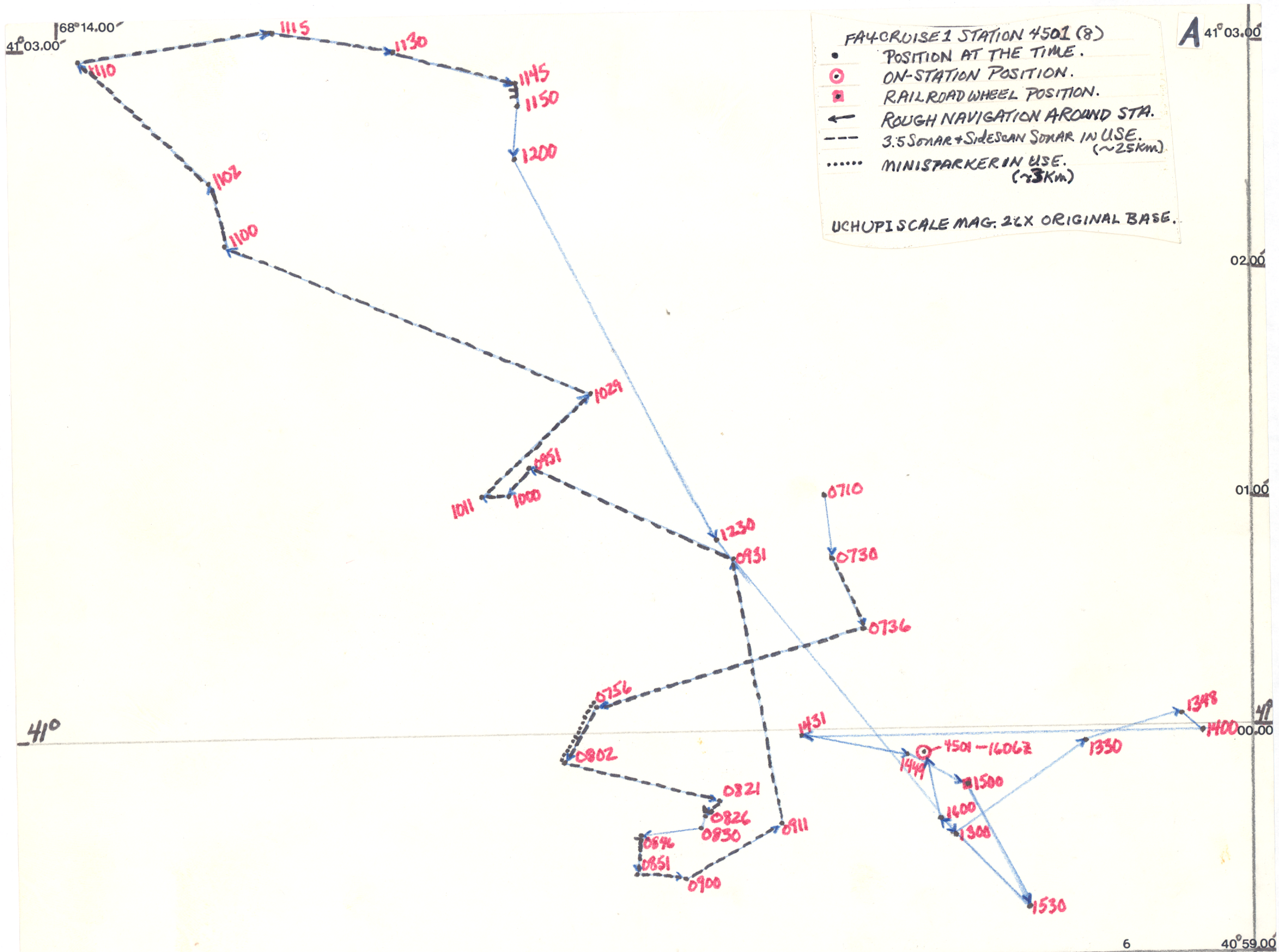

A
41°03.00
68°14.00
41°03.00
02.00
01.00
00.00
40°59.00
6
41°
41
FA4CRUISE1 STATION 4501 (8)
POSITION AT THE TIME.
ON-STATION POSITION.
RAILROAD WHEEL POSITION.
ROUGH NAVIGATION AROUND STA.
3.5 SONAR + SIDESCAN SONAR IN USE. (~25Km)
MINISPARKER IN USE. (~3Km)
UCHUPI SCALE MAG. 2.2X ORIGINAL BASE.
1110
1115
1130
1145
1150
1200
1102
1100
1029
0951
1011
1000
1230
0931
0710
0730
0736
0756
0802
0821
0826
0830
0846
0851
0900
0911
1431
4501-16062
1449
1500
1600
1300
1530
1330
1348
1400

FAY - CRUISE 1 STATION 4503 (13)

• POSITION AT THE TIME.

NB ■ POSITION OF NORTH BOUY.

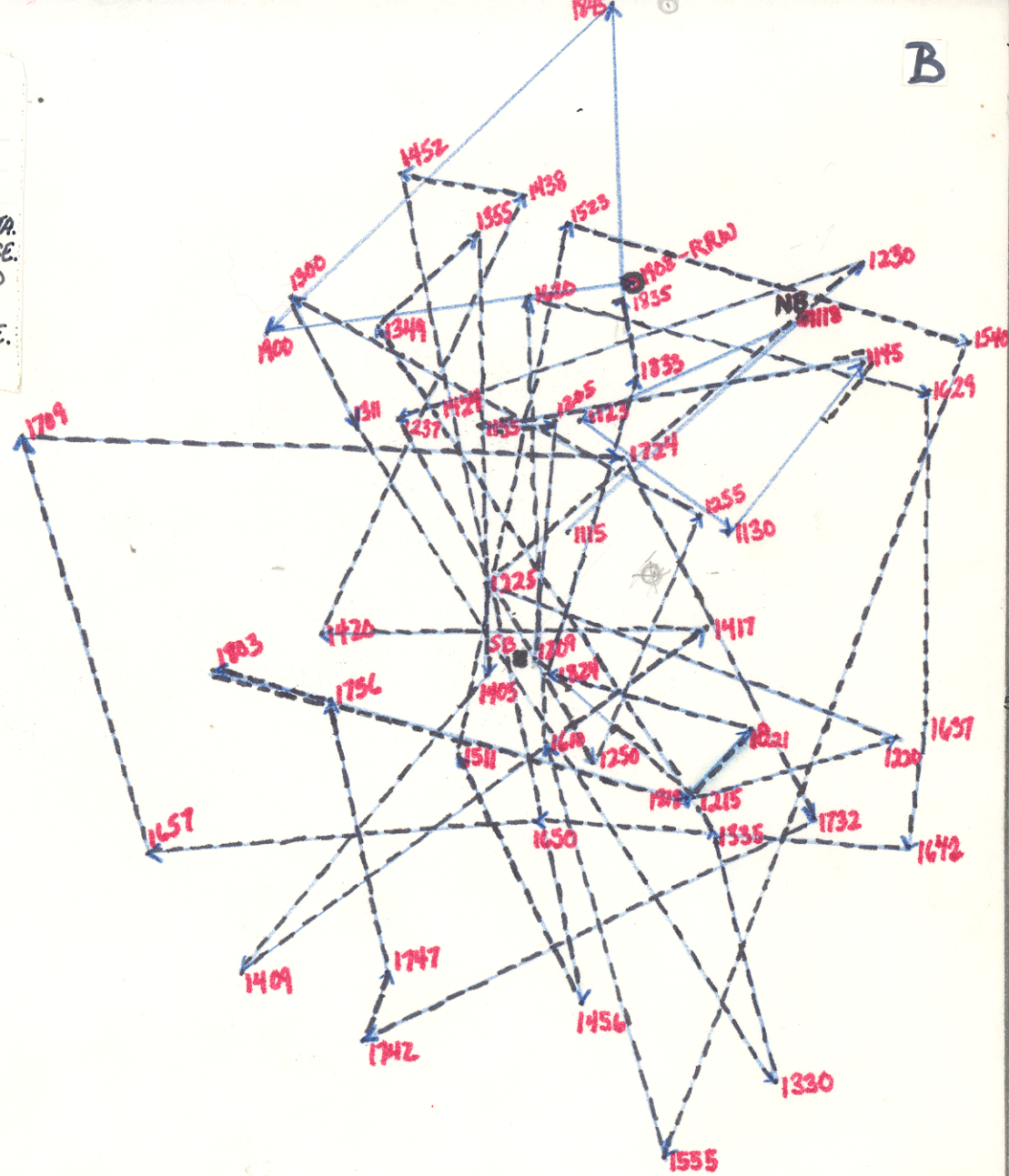
SB ■ POSITION OF SOUTH BOUY.

⊙ RRW POSITION OF RAILROAD WHEEL.

← ROUGH NAVIGATION AROUND STA.

- - - 3.5 SONAR + SIDESCAN SONAR IN USE. (~5PKm)

UCHUPI SCALE MAG. 52X ORIGINAL BASE.



Memorandum

TO : Dave Folger **DATE:** 24 September 1975

FROM : Michael Bothner, Chief Scientist

SUBJECT: Description of equipment failures causing interruptions of sampling cruise on George's Bank aboard R.V. Fay, September 2 - September 22.

The first part of this cruise departed Woods Hole at 1700 hrs. on 2 September 75, and arrived at the first station (#4500, 40° 60'N, 67°, 44'W) at 1000 hrs. on 3 September 75. As the anchor was being lowered at this station, the shaft driving the anchor winch fractured disabling the anchoring system. The anchor chain was cut.

The Chief Scientist, the supervisor of the vibracore crew, and the ship's captain decided to attempt ~~to carry on~~ the vibracore operations without the anchor. A buoy was deployed at station 4500 for a position reference. The three attempts to collect a vibracore sample ended with damaged equipment or no sample because of unavoidable ship drift during the coring operations. The Chief Scientist, the supervisor of the vibracore crew and the ship's captain decided that this operation could not be carried out without anchoring capability.

The Chief Scientist then decided to carry out the part of our planned operations which did not require anchoring and informed the U.S.G.S. office and Tracor Marine (through the ship's captain) of our equipment failure so that preparations could be made for a rapid repair on return to port. Operations not requiring anchoring were completed at 1408 hrs., 7 September 75. The ship returned to port for anchor winch repairs at 0648, 8 September 75.

(For Leg 1, (B), see Dillon Report)

The third part of Leg 1, (C), departed Woods Hole at 2400 hrs., 16 September 75. There were no major delays caused by breakdown of ship's equipment or sampling equipment. All work was completed satisfactorily. The ship returned to port at 1530 hrs., 22 September 1975.

CRUISE REPORT

Fay Cruise 1, part B

R.V. FAY was available to sail, with windlass temporarily repaired, chain and anchor aboard and crane repaired at about 1600 hrs., 12 Sept. 1975. Due to gale warnings flying and high winds and seas reported on Georges Bank, which would have prevented operations, I chose to hold the ship until the weather front passed. The delay also allowed us to pass through Great Round Shoals Channel, which Captain Ostenson would not attempt in poor visibility and saved 5 hours of steaming time to the first sampling site. We sailed at 0600 on 13 Sept. 1975. I spoke to Folger (aboard Advance II on Georges Bank) at 0900 and 1200. At 0900, the front had not passed the site (site 13) where we would rendezvous and at noon seas were still high and confused. We reached site 13 at about 1900 hours, searched for and found the buoy, and as swells were down to 3-4 feet, prepared to anchor.

On anchoring, it was discovered that the brake on the anchor windlass would not hold and anchor and chain were nearly lost. A stopper was put on the anchor chain and the sampling commenced.

We made three (3) attempts to obtain a hydrostatically damped core. On the third attempt, the corer hit the rudder or hull while being raised. Apparently, one of the joints in the frame slipped apart and subsequently other joints broke as the ship rolled in the swell. The principle reason for damage to the sampler was lack of an hydraulic A-frame which would have positioned the device farther outboard during raising and lowering. Surface and bottom water samples were obtained and filtered.

Two attempts were made to obtain a vibrocore, the second one successful. Two attempts were made to set pipe, unsuccessfully. One of the air hoses had developed a bubble in its wall and the vibrator was not working properly. While the Alpine crew were working on the corer, the air com-

pressor used to power the corer and its winch failed and seized up at 0330, 14 Sept. 1975. As this was the primary sampling system of the cruise the decision was made to return to Woods Hole, where we arrived at 1800, 14 Sept.

William P. Dillon
Chief Scientist